UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,731	02/09/2004	Tung-Shuan Cheng	TSMC2003-1129(N1280-00350	1527

54657 7590 03/06/2006

DUANE MORRIS LLP
IP DEPARTMENT (TSMC)
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103-4196

EXAMINER	
ZWEIZIG, JEFFERY SHAWN	
ART UNIT	**PAPER NUMBER**
2816	

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/775,731
Filing Date: February 09, 2004
Appellant(s): CHENG ET AL.

Duane Morris
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/13/05 appealing from the Office action mailed 6/23/05.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect. The amendments after final rejection were entered in-part as indicated on the Advisory Action mailed 10/7/05 and copied below:

For the purposes of appeal, the proposed amendment to the specification would be entered and the objection to the specification would be withdrawn.

For the purposes of appeal, the proposed amendments to Figs. 4A-4C and 5A-5C would be entered and the objection to the drawings would be withdrawn.

The proposed amendments to Figs. 7A-7D will not be entered, as the replacement sheet appears to be identical to the original drawings. It is not understood why a replacement for Figs. 7A-7D was submitted since there appears to be no outstanding issue with Figs. 7A-7D.

The proposed amendment to claim 11 as mentioned in Applicant's response was not found. No proposed amendments to the claims were found. Therefore no amendments wiil be eneteed.

The effect of the entered amendments is the cancellation of all that was deemed new matter. Appellant appears to agree that all new matter has been cancelled as indicated, for example, in the second paragraph on page 4 of the Appeal Breif.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. As noted above, the after final amendments were entered in-part and the new matter issues are moot. The changes are as follows:

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

A. Under 35 U.S.C. I 32(a), 1st paragraph, was it proper to cancel amendments of the specification as allegedly "new matter"?

B. Under 35 U.S.C. 1 12, 1st paragraph, was it proper to reject claims 1-20 as allegedly lacking written description in the specification.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,762,640	Katsuhisa	7-2004
6,714,065	Komiya et al.	3-2004
6,002,599	Chow	12-1999

Behzad Razavi, PRINCIPLES OF DATA CONVERSION SYSTEM DESIGN, November 1995, IEEE, Inc., New York, pages 64-78

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Elements critical or essential to the practice of the invention, but not included in the claims is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Claim 1 recites a digital to analog converter coupled to the oscillator for generating an analog signal of predetermined voltage level based on the pumping signal as configured by a set of inputs thereof; and a charge pump coupled to the DAC for producing a dc output based on the analog signals.

The disclosure does not properly enable one of ordinary skill in the art to understand how an analog signal of predetermined voltage level is generated or how a dc output based on the analog signal is generated. Insofar as understood, the analog

signal is directed toward the output of DAC 306 (Fig. 4A) or the input to charge pump 310 (Fig. 5A). Fig. 4C appears to show a varying voltage output. This in itself is not understood as the circuit shown in Fig. 4A appears to be configured to provide a varying charge output, not a varying voltage output. It is not seen how the output voltage would vary as the pull up transistors are all connected to the same Vcc. In any event, the DAC shows only one output whereas the charge pump requires two inputs CLK & CLKB. One of ordinary skill in the art could generate CLKB from CLK with a simple inverter, however, as pointed out above, the DAC appears to produce a varying charge output, not a varying voltage output. A mere inverter would not effectively transmit such a charge transfer. Since the specification is silent as to exactly how the circuit shown in Fig. 4A would interface with the circuit shown in Fig. 5A and since the two circuits appear to be incompatible, the nature of the claimed analog signal cannot be understood.

The disclosure does not properly enable one of ordinary skill in the art to understand how the pumping signal is to be configured by a set of inputs. Insofar as understood, the pumping signal is directed toward the output of oscillator 302 and the set of inputs is directed toward the input to code converter 308. The specification ambiguously describes the output of code converter 308 as a set of finely-divided thermometer signals. No further definition is provided. Thus the nature of the signals 316 is unknown. Control module 304 combines the pump signal and signals 316 to provide outputs to DAC 306. However, the specification provides no explanation as to the nature of module 304's construction or function. The specification is also silent as to

the nature of the signals output from module 304. Thus the nature of the signals output from module 304 is unknown. The specification indicates that components 304, 306 and 316 may be combined into a single unit as shown, for example, as 702 in Fig. 7A, however, such a DAC would be quite unconventional. The inner working of such a device cannot be dismissed without further explanation. As best understood, an object of the present invention is to selectively modify the amplitude of a square wave in discrete increments. Describing such a circuit as a digital to analog converter is questionable. Thus, it is not known how the pump signal is configured by a set of inputs.

Claim 1 and dependent claims 2-11 are not properly enabled.

Claim 12 has the same problems. Claim 12 and dependent claims 13-16 are not properly enabled.

Claims 17-20 have the same problems and are not properly enabled.

Additionally, claim 11 recited a voltage doubler. No voltage doubler has been disclosed. As best understood, the "voltage doubler" is directed toward component 704 shown in Fig. 7A. As shown in Fig. 7D, the voltage is not doubled. The output voltage from 704 is not doubled, but is the sum of a varying input voltage and a fixed voltage Vdd. Claim 11 is not properly enabled.

Claim Rejections - 35 USC § 102

Claims 1, 4, 5, 10 & 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Chow (6,002,599).

As best understood, Fig. 5 discloses an oscillator (inherent) for generating a square pump signal within a predetermined operating voltage CLK, analog signals o1 & o2, a set of inputs Vin & Vref, and a charge pump 32 with a dc output Vpp as recited in claims 1, 4 & 5. As best understood, the recited DAC is directed toward a circuit for modifying the amplitude of the pump signal. Fig. 5 discloses a "DAC" 31 that functions as recited in claim 1.

The DAC has a predetermined number of inputs (2) based on a predetermined number of steps (1) as recited in claim 10.

As best understood, the output from the "voltage doubler" 32 is the sum of the input and supply voltages as recited in claim 11.

Claim Rejections - 35 USC § 103

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Katsuhisa (USPN 6,762,640).

Chow does not appear to disclose a load capacitor as recited in claim 2. However, charge pumps with load capacitors are common in the art. Katsuhisa Fig. 3 shows an example load capacitor C0. It would have been obvious to one of ordinary skill in the art at the time of the invention to add a load capacitor to Chow as taught by Katsuhisa for the benefit of filtering the output voltage from the charge pump. Claim 2 is obvious.

Claims 3, 6, 12, 14, 16, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Komiya et al. (USPN 6,714,065).

Chow does not appear to disclose a ring oscillator as recited in claim 3. However, charge pumps with ring oscillators are common in the art. Komiya et al. Fig. 5 shows an example ring oscillator 101. It would have been obvious to one of ordinary skill in the art at the time of the invention to add a ring oscillator to Chow as taught by Komiya et al. for the benefit of providing the pump signal CLK. Claim 3 is obvious.

Chow does not disclose a negative charge pump for substrate biasing as recited in claim 6. As pointed out in Applicants' background of the invention, the application of negative voltages to substrates is known. Further, it is commonly known that a charge pump's output polarity may be reversed merely by reversing the polarities of the charge pump's transistors and supply voltages. Komiya et al. Figs. 2A, 2B and 3-8 show examples of this procedure. It would have been obvious to one of ordinary skill in the art at the time of the invention to reverse the polarity of Chow's output as taught by Komiya et al. for the benefit of providing negative voltage to bias a substrate and prevent device leakage. Claim 6 is obvious.

Claims 12, 14, 16 and 17 are obvious for the reasons above.

Chow and Komiya et al. do not appear to specify voltages as recited in claim 20, However, those of ordinary skill in the art are intuitively motivated to optimize their circuits for best performance. It would have been obvious to one of ordinary skill int the art at the time of the invention to select a desired bias voltage for the benefit of optimizing leakage current. Claim 20 is obvious.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Komiya et al. and Katsuhisa.

As per the reasons above, it would have been obvious to add a load capacitor as taught by Katsuhisa to the combination of Chow and Komiya et al. Claims 13 and 18 are obvious.

(10) Response to Argument

The arguments on pages 4 and 5 of the Appeal Brief pertain to issues of new matter. As has been indicated in sections (4) and (6) of this Examiner's Answer, the subject matter in question has been cancelled, all related new matter objections and rejections have been withdrawn and, therefore, the new matter issues are moot.

On page 6 of the Appeal Brief Appellant argues the enablement rejections. Appellant presents a reference "PRINCIPLES OF DATA CONVERSION SYSTEM DESIGN". Examiner notes that Appellant informally supplied this reference on 5/23/05. Examiner has now noted this reference on an attached PTO-892 so as to make it officially of record. This reference is not seen to be of any particular relevance to the rejection. The reference supports Appellant's contention that the DAC shown in Appellant's Fig. 4A is indeed Prior Art. However, the reference is silent as to how such a DAC would interface with the charge pump shown in Appellant's Fig. 5A. The disclosed DAC has a single output (output). The disclosed charge pump has two inputs (CLK & CLKB). Neither the reference nor Appellant's own disclosure indicate how the DAC disclosed in

Fig. 4A would generate the two complementary inputs required by Fig. 5A. Neither the reference nor Appellant's own disclosure indicate how the charge pump disclosed in Fig. 5A could operate with only the single output provided from the DAC disclosed in Fig. 4A. Returning to Appellant's Fig. 3A, Examiner is unable to resolve the connection between boxes 306 and 310 because the disclosed DAC is not physically compatible with the disclosed charge pump. Thus the nature of the claimed analog signal is unknown and not properly enabled.

Examiner notes that Appellant's enablement argument does not address Examiner's entire enablement rejection. The disclosure does not properly enable one of ordinary skill in the art to understand how the claimed pumping signal is to be configured by the claimed set of inputs. The oscillator disclosed in Appellant's Fig. 3A outputs a single square-wave pumping signal as shown in Fig. 3B. The DAC requires a plurality of inputs as disclosed in Fig. 4A. Presumably, box 304 converts the single pumping signal into a plurality of DAC-compatible inputs based on a further set of inputs provided to box 308. This complicated operation is not seen to be well known or trivial, yet the disclosure is silent as to the operation of boxes 304 and 308. The nature of the interface between the oscillator 302 and the DAC 306 is unknown, therefore, the recited " generating an analog signal of predetermined voltage level based on the pumping signal as configured by a set of inputs thereof" is not properly enabled.

Appellant has also failed to address the enablement rejection that was specifically directed at claim 11.

On page 7 of the Appeal Brief Appellant argues the anticipation rejections. Appellant generally argues that the Chow reference cannot anticipate the claimed invention because Chow does not disclose the claimed digital to analog converter (DAC). Examiner has maintained that this is merely an argument of terminology semantics. The invention is directed toward a "DAC" for generating an analog signal of predetermined voltage level based on a pumping signal. The pumping signal is shown, for example, in Appellant's Fig. 3B. The analog signal is shown, for example, in Appellant's Fig. 3C. Note that the claimed "analog signal" is actually a square wave with an adjustable amplitude. The Chow circuit 31 shown in Fig. 5 is labeled "Adaptive Swing Clock Generator". This is exactly what the claimed "DAC" does. The claimed "DAC" adapts the swing of the pump signal. Appellant's claim 1, for example, provides no physical definition of the "DAC", only a functional description. Examiner maintains that the Chow circuit 31 is a "DAC" within the context of the present invention. Examiner's position is supported by the enablement rejection that indicates Appellant never resolved how a conventional DAC would fit into the disclosed invention in the first place. Appellant argues that Chow does not disclose "a digital to analog converter (DAC) coupled to the oscillator for generating an analog signal of a predetermined voltage level based on the pumping signal as configured by a set of inputs thereto". That is exactly the function of the Chow circuit. The claim defines the function of the circuit, not the circuit itself. On page 7 of the Appeal Brief around line 10, Appellant argues that Chow does not show inputs for adjusting the analog signal output. The analog signal output o1/o2 depends on signals Vin and Vref and is, therefore, adjusted

by those signals. The claim language does not preclude a closed loop negative feedback circuit. Around line 13 of the Brief, Appellant argues that there are no digital inputs to Chow 31. As indicated in previous Office Actions, CLK is seen as a digital input. Around line 15 of the Brief, Appellant argues that the Chow outputs are not set by digital inputs. That limitation is not in the claim. Around line 19 of the Brief, Appellant argues that Chow Vfb is not an input. Vfb is clearly an input to 31, which for the purposes of the rejection is considered a DAC.

On pages 7 and 8 of the Appeal Brief Appellant argues the obviousness rejections. Appellant's arguments rehash the position that none of the references disclose a DAC. As pointed out above, Examiner maintains that Chow does disclose a "DAC" within the context of the claimed invention.

On page 8 of the Brief, Appellant notes that there are no art rejections on claim 19. True. However, Examiner did not indicate allowable subject matter in light of the enablement rejection that does include claim 19.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

JZ

2/15/06

JEFFREY ZWEIZIG
PRIMARY EXAMINER

Conferees:

Timothy Callahan

Darren Schuberg

Duane Morris LLP

101 W. Broadway, Suite 900

San Diego, CA 92101